A. I. A. File Number 13g

DESIGN

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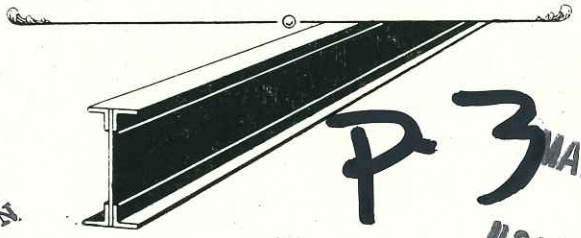
TRUSCON
STEEL JOISTS
P.G
PLATE GIRDER TYPE



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ECONOMICAL AND
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TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO
TRUSSED CONCRETE STEEL COMPANY OF CANADA, LIMITED, WALKERVILLE, ONT.

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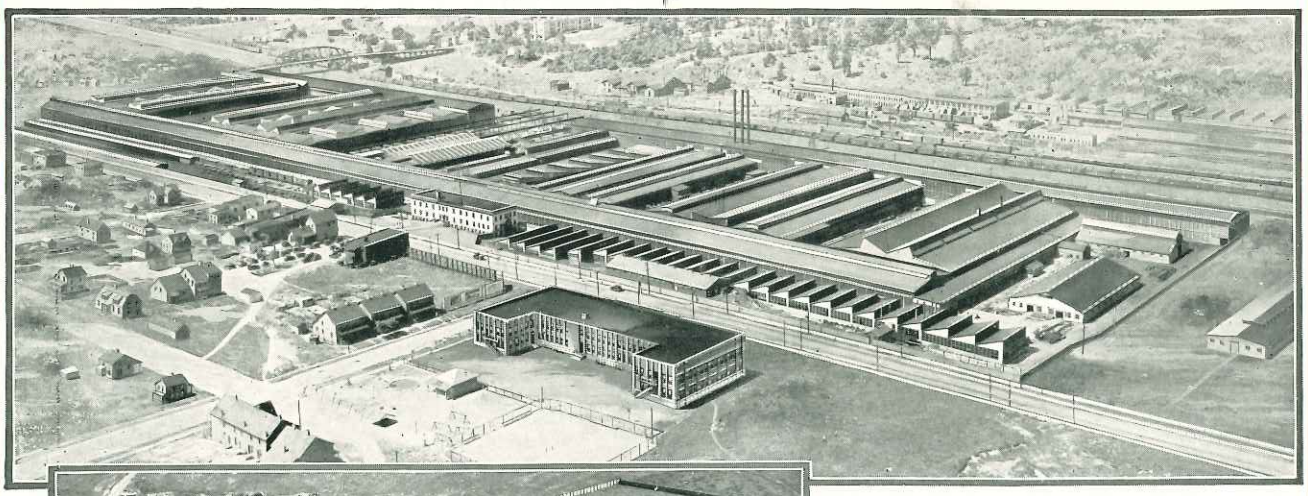
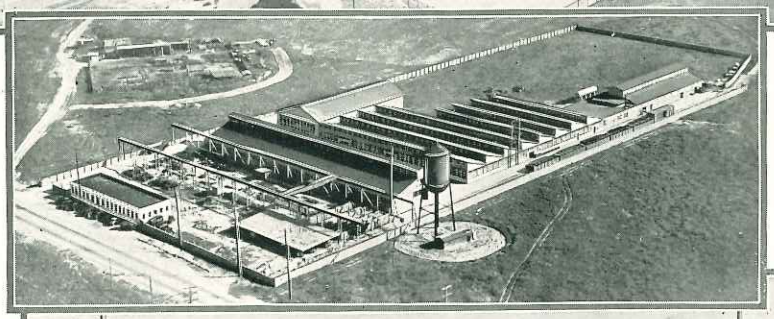
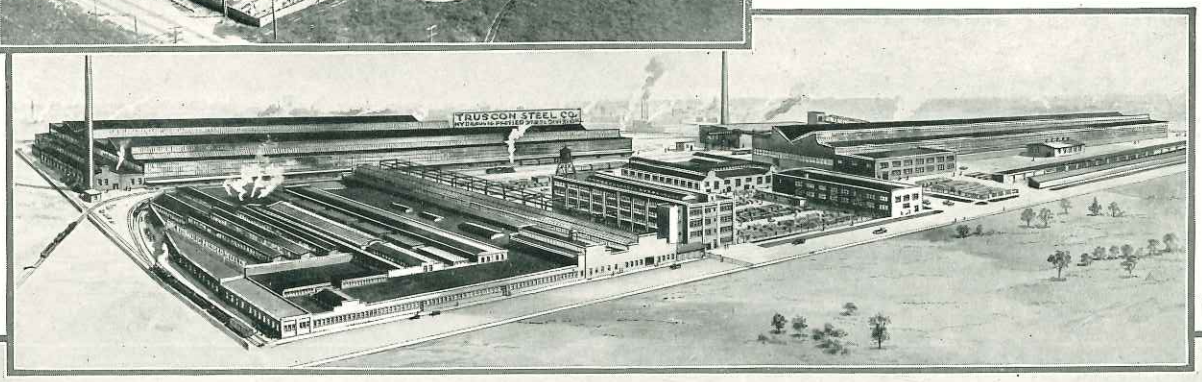
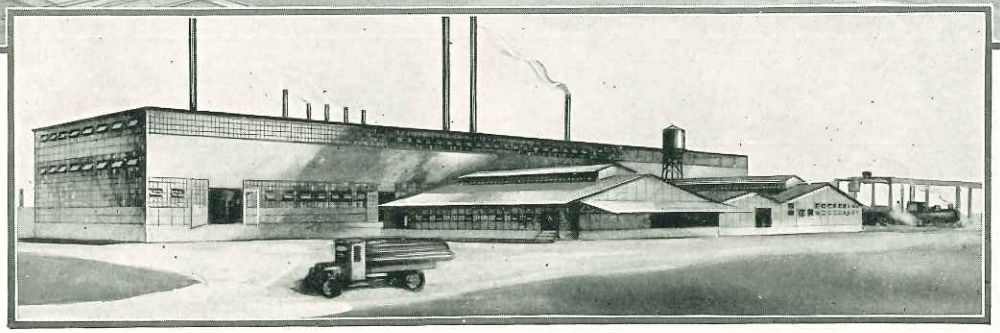




1. Truscon's 50-acre Main Plant at Youngstown, Ohio.
2. Truscon Pacific Coast Plant, Los Angeles, California.
3. Hydraulic Pressed Steel Division of Truscon, Cleveland, Ohio.

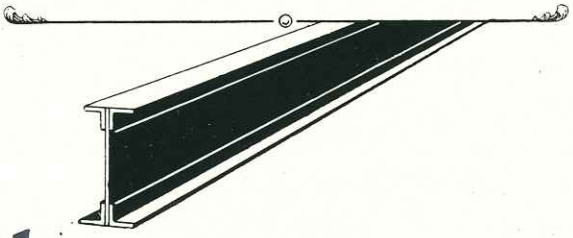




4. The Truscon Laboratories, Detroit, Michigan.
5. Truscon Steel Company of Japan, Ltd., Kawaski, Japan.

Gray, Res. Div.
6/17/49 - Left.

TRUSCON
STEEL JOISTS
P.G
PLATE GIRDER TYPE



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for
ECONOMICAL AND
FIREPROOF FLOOR
CONSTRUCTION

No. 608

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Truscon manufactures a complete line of Steel Joists for fireproof floor construction, including Open Truss and Nailer Joists.

TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO
TRUSSED CONCRETE STEEL COMPANY OF CANADA, LIMITED, WALKERVILLE, ONT.

Warehouses and Offices in all Principal Cities in the United States and Canada

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For Economical and Fireproof Floors

THE Truscon P-G (Plate Girder) Steel Joist, as its name implies, is a substantial structural steel unit, comparable in design and construction with the plate girders of bridges and buildings.

It is designed and manufactured in strict conformity with the specifications of the Steel Joist Institute.

The flanges are made up of structural steel angles which are welded to the steel web to form a plate girder of enduring strength. The welding is by the high pressure electric system, assuring the perfect union of all parts.

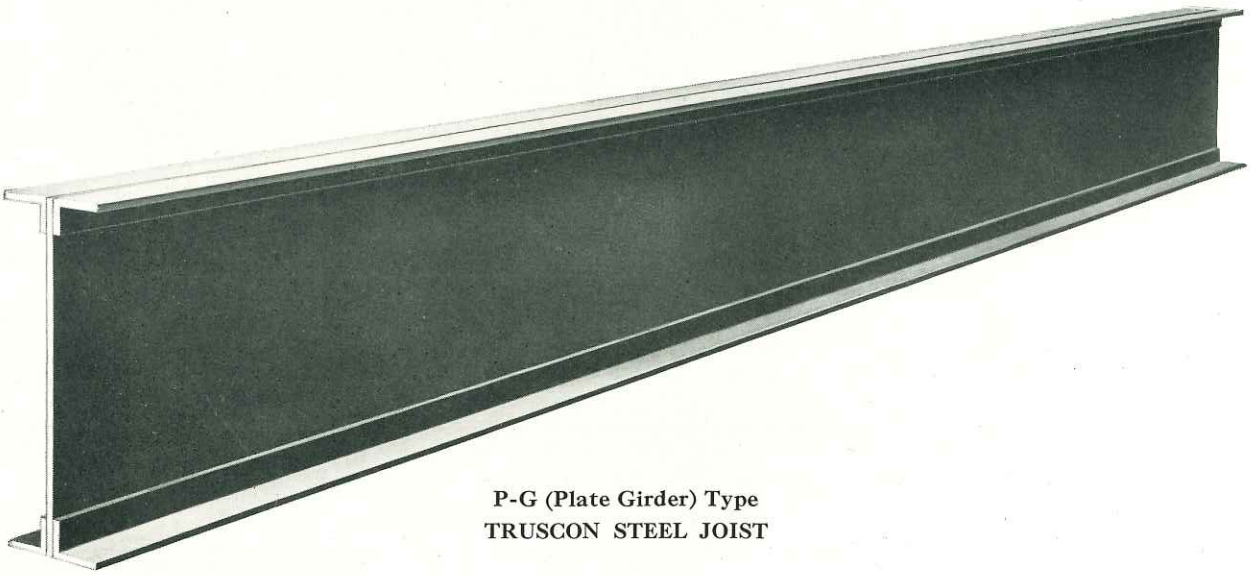
Truscon P-G (Plate Girder) Steel Joists are furnished in depths ranging from 6″ to 14″, which enables the architect or engineer to meet his particular conditions with the most efficient design.

Truscon Steel Joists are fabricated complete at the factory and reach the job ready for erection. Each joist is clearly marked to correspond with the placing diagram, thus greatly simplifying and speeding up construction work.

The nation-wide organization of Truscon Engineers will gladly co-operate with suggestions, estimates and any information desired.

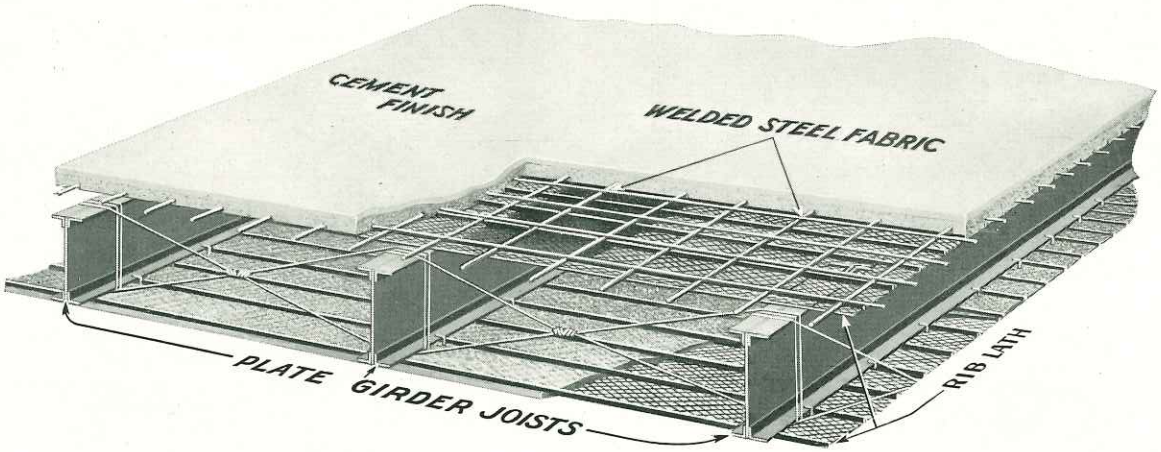
TRUSCON STEEL COMPANY, YOUNGSTOWN, OHIO
A MEMBER COMPANY OF THE STEEL JOIST INSTITUTE

Warehouses and Offices in all Principal Cities



P-G (Plate Girder) Type
TRUSCON STEEL JOIST

Construction Details

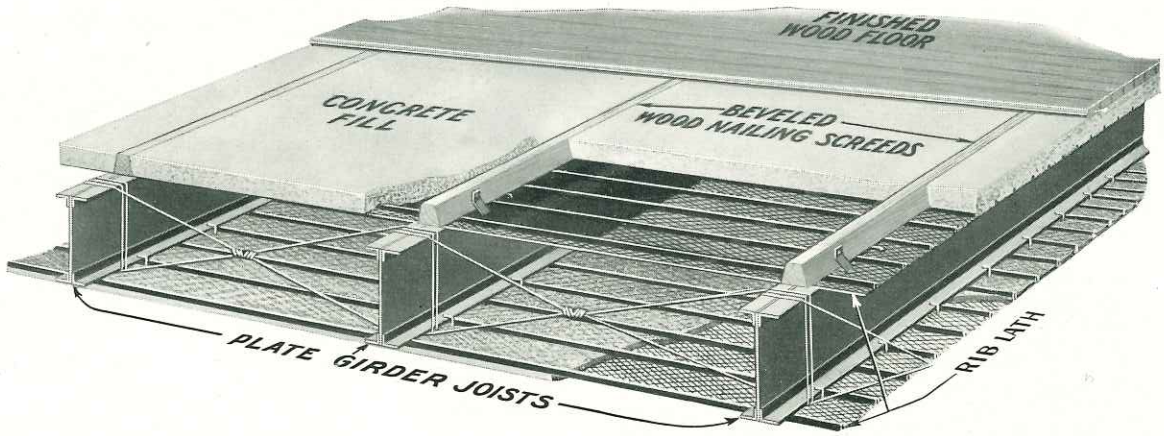


TRUSCON P-G (PLATE GIRDER) STEEL JOIST CONSTRUCTION WITH CEMENT FLOOR FINISH.
3/8" DIAMOND RIB LATH FOR FLOOR AND CEILING.

PATENT OFFICE

JUL 15 1949

DESIGN DIVISION



TRUSCON P-G (PLATE GIRDER) STEEL JOIST CONSTRUCTION WITH WOOD FLOOR FINISH.
3/8" DIAMOND RIB LATH FOR FLOOR AND CEILING.

Advantages of P-G (*Plate Girder*) Type Steel Joist Design

ADAPTABILITY—P-G (Plate Girder) Steel Joists are used with equal facility in all kinds of buildings, regardless of their location. They are used in small buildings, at practically the same cost per square foot as in the large ones, having the same economy in the first floor of a residence as in a sky-scraper. Fireproof construction is thus made available in thousands of places where other systems of fireproof construction are not practical.

ECONOMY—The economy of P-G (Plate Girder) Steel Joists occurs not only in the construction itself but in the savings that their light weight effects throughout the building in the supporting framework and foundations, and in the advantages it offers to other contractors working in the same building. Its speedy erection protects the original investment and minimizes the overhead expense. In the completed building, the durability and permanence of P-G (Plate Girder) Steel Joist Construction saves in insurance costs and maintenance expense.

SPEED OF ERECTION—The erection of P-G (Plate Girder) Steel Joists is very rapid, because all units are shop-fabricated and reach the job ready for placing with a minimum amount of field labor. Being self-sustaining, any number of floors can be constructed at one time. No centering or false work is required. No special equipment is needed.

ALL WEATHER BUILDING—The construction is installed as readily in winter as in summer. Unlike many other fireproof construction systems, P-G (Plate Girder) Steel Joist Construction is not dependent upon the setting of cement, which is seriously retarded by cold weather.

FIREPROOFNESS—Ample strength is available up to maximum temperatures with no tendency to twist or distort. Fire tests prove that $\frac{7}{8}''$ of cement or gypsum ceiling plaster protects P-G (Plate Girder) Steel Joist Construction against high temperatures.

CRACKPROOFNESS—Truscon P-G (Plate Girder) Steel Joist Construction has no tendency to shrink, swell or warp. Metal Lath thoroughly reinforces the plaster and prevents its cracking. The saving in cost of redecoration and in expense for repairs is substantial.

SOUNDPROOFNESS—Truscon P-G (Plate Girder) Steel Joist Construction is exceptionally soundproof. The extreme rigidity of the construction prevents the vibration of the entire floor as a body. Its soundproofness is practically demonstrated by the unusually satisfactory results obtained in a great number of high class buildings.

LIGHT WEIGHT—The light weight of P-G (Plate Girder) Steel Joist Construction is of utmost value in adding stories to old buildings, often permitting the addition of a floor more than originally contemplated.

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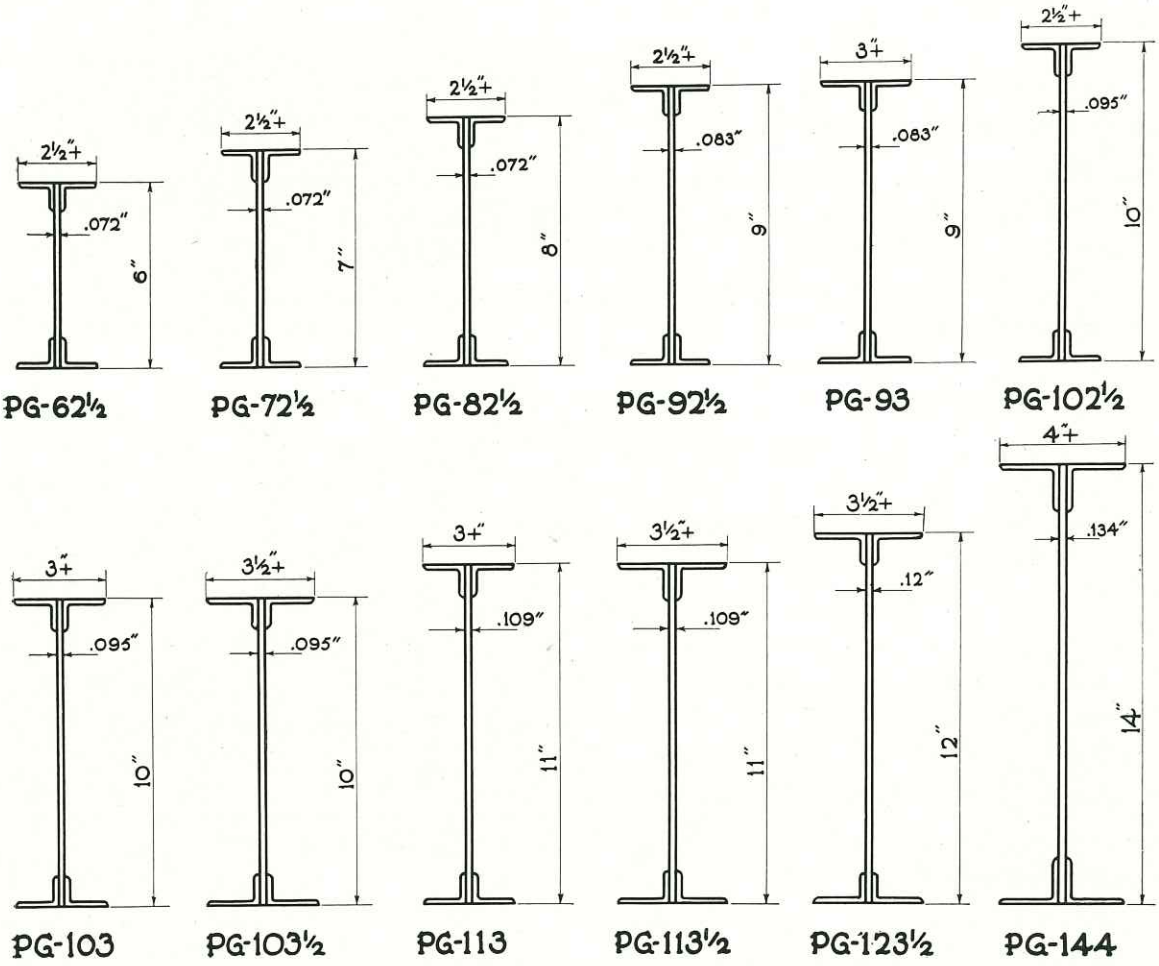
Standard Sections
P-G (*Plate Girder*) Type Steel Joists



PROPERTIES OF "P.G" SECTIONS

Section	Depth	Flange Width	Weight per Ft. in Pounds	Thickness of Metal		Moment of Inertia	Section Modulus
				Flange	Web		
PG 62½	6	2½+	5.0	.125	.072	9.32	3.11
PG 72½	7	2½+	5.3	.125	.072	13.24	3.78
PG 82½	8	2½+	5.6	.125	.072	17.95	4.49
PG 92½	9	2½+	6.1	.125	.083	24.15	5.37
PG 93	9	3+	6.5	.125	.083	26.59	5.91
PG 102½	10	2½+	6.8	.125	.095	31.78	6.36
PG 103	10	3+	7.2	.125	.095	34.81	6.96
PG 103½	10	3½+	7.6	.125	.095	37.88	7.58
PG 113	11	3+	8.1	.125	.109	44.92	8.17
PG 113½	11	3½+	8.5	.125	.109	48.64	8.84
PG 123½	12	3½+	9.3	.125	.120	61.08	10.18
PG 144	14	4+	12.0	.125	.134	104.52	14.93

TABLE No. 1

TOTAL SAFE LOADS

IN POUNDS PER SQUARE FOOT UNIFORMLY DISTRIBUTED

Designed in Accordance with

TRUSCON STEEL COMPANY'S SPECIFICATIONS

Using Maximum Stresses of 16,000 Pounds per Square Inch

Type Joist	Clear Span	Total Safe Load	TOTAL SAFE LOAD PER SQUARE FOOT FOR VARIOUS JOIST SPACINGS												
			12″	13″	14″	15″	16″	17″	18″	19″	20″	21″	22″	23″	24″
PG62½	9′–0″	3270	364	335	312	291	273	256	242	229	218	208	198	190	182
	10′–0″	3270	327	302	280	262	245	231	218	206	196	187	178	171	164
	11′–0″	3005	273	252	234	218	204	193	182	172	164	156	148	142	136
	12′–0″	2755	230	212	197	183	172	162	153	145	138	131	125	119	115
PG72½	9′–0″	4020	447	412	383	357	335	316	298	282	268	255	244	233	223
	10′–0″	4020	402	371	346	322	302	284	268	254	241	230	220	210	201
	11′–0″	3665	333	307	288	266	250	236	222	210	200	191	184	174	166
	12′–0″	3360	280	258	240	224	210	198	187	176	168	160	153	146	140
	13′–0″	3105	239	221	206	191	179	169	160	151	143	137	131	125	119
	14′–0″	2880	206	190	176	165	154	145	137	130	123	118	113	107	103
PG82½	12′–0″	3616	301	278	258	241	226	213	201	190	181	172	164	157	150
	13′–0″	3616	278	256	238	222	208	196	185	175	167	158	152	145	139
	14′–0″	3420	244	226	209	195	183	172	163	154	146	140	133	127	122
	15′–0″	3190	213	196	182	170	159	150	142	134	128	121	116	111	106
	16′–0″	2990	187	173	160	149	140	132	124	118	112	107	102	98	93
PG92½	12′–0″	4193	349	323	300	280	262	247	233	221	210	200	191	182	175
	13′–0″	4193	322	298	276	258	240	228	214	203	193	184	176	168	161
	14′–0″	4085	292	270	250	233	218	206	194	184	175	166	159	152	146
	15′–0″	3820	254	235	218	204	191	180	170	160	153	145	139	133	127
	16′–0″	3580	224	206	192	179	168	158	149	141	134	128	122	117	112
	17′–0″	3370	198	183	170	159	148	140	132	125	119	113	108	103	99
	18′–0″	3180	176	163	151	141	132	125	118	111	106	101	96	92	88
PG93	14′–0″	4193	300	276	257	240	225	211	200	189	180	171	163	156	150
	15′–0″	4193	280	258	240	224	210	197	186	176	167	160	152	145	140
	16′–0″	3940	246	227	211	197	185	174	164	155	148	141	134	129	123
	17′–0″	3705	218	201	187	174	163	154	145	137	131	124	119	114	109
	18′–0″	3500	194	180	166	155	146	137	130	122	116	111	106	101	97
PG102½	12′–0″	5032	419	387	359	335	314	296	279	265	251	239	228	218	209
	13′–0″	5032	386	356	332	310	290	273	258	244	232	220	211	202	193
	14′–0″	4845	346	319	296	276	259	244	230	218	208	198	188	180	173
	15′–0″	4520	302	278	259	241	226	213	201	190	181	172	164	157	151
	16′–0″	4240	265	244	227	212	198	187	176	167	159	151	144	138	132
	17′–0″	3985	234	216	201	187	176	165	156	148	140	134	128	122	117
	18′–0″	3765	209	193	179	167	157	147	139	132	125	119	114	109	104
	19′–0″	3565	188	173	161	150	140	133	125	118	113	107	102	98	94
	20′–0″	3390	169	156	145	135	127	120	113	107	102	97	93	89	85
PG103	13′–0″	5032	387	357	332	310	290	273	258	244	232	221	211	202	193
	14′–0″	5032	359	331	308	287	270	253	239	226	216	205	196	187	180
	15′–0″	4950	330	305	284	264	248	234	220	209	198	189	180	172	165
	16′–0″	4640	290	268	248	232	217	205	193	183	174	166	158	151	145
	17′–0″	4370	257	237	219	205	192	181	171	162	154	146	140	133	128
	18′–0″	4130	229	211	196	183	172	162	153	144	137	131	125	119	115
	19′–0″	3910	206	190	176	165	155	145	137	130	124	118	112	107	103
	20′–0″	3715	186	172	159	149	139	131	124	117	112	106	102	97	93

TRUSCON P-G (*Plate Girder*) STEEL JOISTS

TABLE No. 1 (Continued)

Type Joist	Clear Span	Total Safe Load	TOTAL SAFE LOAD PER SQUARE FOOT FOR VARIOUS JOIST SPACINGS												
			12″	13″	14″	15″	16″	17″	18″	19″	20″	21″	22″	23″	24″
PG103½	15′–0″	5032	335	310	288	268	252	237	224	212	201	192	183	175	168
	16′–0″	5032	315	290	270	252	236	222	210	198	189	180	172	164	157
	17′–0″	4760	280	258	240	224	210	198	187	177	168	160	153	146	140
	18′–0″	4500	250	231	214	200	187	176	167	158	150	143	136	130	125
	19′–0″	4260	224	207	192	179	168	158	149	142	135	128	122	117	112
	20′–0″	4050	202	187	174	162	152	143	135	128	122	116	110	106	101
PG113	12′–0″	6404	535	493	457	427	400	377	356	337	320	305	291	278	267
	13′–0″	6404	493	456	421	394	370	348	329	311	296	282	269	257	247
	14′–0″	6225	445	410	381	355	333	313	296	280	266	254	242	231	222
	15′–0″	5810	388	358	332	310	291	274	258	245	233	221	212	202	194
	16′–0″	5450	340	314	292	272	255	240	227	215	204	194	186	178	170
	17′–0″	5130	302	278	259	242	226	213	201	191	181	173	165	158	151
	18′–0″	4845	269	248	230	215	202	190	179	170	161	153	147	140	134
	19′–0″	4585	241	223	207	193	181	170	161	152	145	138	131	126	121
	20′–0″	4355	218	202	187	175	164	154	145	138	131	125	119	114	109
	21′–0″	4150	198	183	169	158	148	140	132	125	119	113	108	103	99
	22′–0″	3965	180	167	155	144	135	127	120	114	108	103	99	94	91
PG113½	13′–0″	6404	493	455	423	395	370	348	328	312	296	282	269	257	246
	14′–0″	6404	458	422	392	368	344	323	306	288	275	262	250	239	299
	15′–0″	6280	419	386	358	334	314	295	279	264	251	239	228	218	209
	16′–0″	5885	367	339	315	294	276	260	245	232	220	210	200	192	184
	17′–0″	5550	326	301	280	261	245	230	217	206	196	186	178	170	163
	18′–0″	5240	291	268	249	232	218	205	194	183	175	166	159	152	145
	19′–0″	4970	261	241	224	209	196	185	174	165	157	149	143	137	131
	20′–0″	4725	236	218	202	189	177	167	158	149	142	135	129	123	118
	21′–0″	4495	214	197	183	171	160	151	143	135	128	122	117	112	107
	22′–0″	4290	195	180	167	156	146	138	130	123	117	111	106	102	97
PG123½	14′–0″	7124	510	470	436	407	382	359	340	322	305	291	278	266	254
	15′–0″	7124	475	438	407	380	356	335	317	300	285	271	259	248	237
	16′–0″	6780	424	391	363	339	318	299	282	268	254	242	231	221	212
	17′–0″	6385	375	347	322	300	282	265	250	237	225	215	205	196	188
	18′–0″	6030	335	309	287	268	251	236	223	212	201	191	183	175	167
	19′–0″	5715	301	278	259	241	226	213	201	190	181	172	164	157	151
	20′–0″	5425	271	250	233	217	204	192	181	171	163	155	148	142	136
	21′–0″	5165	246	228	211	197	185	172	164	155	148	140	134	128	123
	22′–0″	4935	224	207	192	179	168	158	149	141	134	128	122	117	112
	23′–0″	4720	205	190	176	164	154	145	137	130	123	117	112	107	103
	24′–0″	4520	188	174	162	151	141	133	126	119	113	108	103	99	94
PG144	16′–0″	9144	572	527	490	456	428	403	380	360	342	326	311	298	286
	17′–0″	9144	536	496	460	430	403	380	358	339	322	307	293	280	268
	18′–0″	8850	492	454	422	394	369	347	328	310	295	281	268	256	246
	19′–0″	8380	441	408	378	353	331	311	294	278	265	252	240	230	221
	20′–0″	7960	398	368	342	319	299	281	266	252	240	228	218	208	199
	21′–0″	7580	361	333	310	289	271	255	240	228	216	206	197	188	180
	22′–0″	7240	329	303	282	263	246	232	219	207	197	188	179	172	164
	23′–0″	6920	301	278	258	241	226	213	201	190	181	172	164	157	151
	24′–0″	6640	276	255	237	221	207	195	184	174	166	158	151	144	138
	25′–0″	6370	255	235	219	204	191	180	170	161	153	146	139	133	127
	26′–0″	6120	236	218	202	189	177	167	157	149	142	135	129	123	118
	27′–0″	5900	218	202	188	175	164	154	146	138	131	125	119	114	109
	28′–0″	5690	203	188	174	163	153	144	136	129	122	116	111	106	102

TABLE No. 2

TOTAL SAFE LOADS

IN POUNDS PER SQUARE FOOT UNIFORMLY DISTRIBUTED

Designed in Accordance with

STEEL JOIST INSTITUTE SPECIFICATIONS

Using Maximum Stress of 18,000 Pounds per Square Inch

Type Joist	Clear Span	Total Safe Load	TOTAL SAFE LOAD PER SQUARE FOOT FOR VARIOUS JOIST SPACINGS												
			12″	13″	14″	15″	16″	17″	18″	19″	20″	21″	22″	23″	24″
PG62½	9′–0″	3270	364	336	312	291	273	257	243	230	218	208	198	190	182
	10′–0″	3270	327	302	281	262	246	231	218	207	196	187	178	171	163
	11′–0″	3270	297	274	255	238	223	210	198	188	178	170	162	155	149
	12′–0″	2770	231	213	198	185	173	163	154	146	139	132	126	121	116
PG72½	9′–0″	4020	447	414	384	357	335	315	298	282	270	255	243	233	224
	10′–0″	4020	402	371	345	322	302	284	268	254	242	230	219	210	201
	11′–0″	4020	366	338	314	293	275	258	244	231	220	209	200	191	183
	12′–0″	3780	315	291	270	252	236	222	210	199	189	180	172	164	158
	13′–0″	3370	259	239	221	207	194	182	172	163	155	148	141	135	130
	14′–0″	2905	208	192	178	166	156	147	138	131	125	119	104	109	104
PG82½	12′–0″	3616	301	278	258	241	226	212	201	190	180	173	164	157	151
	13′–0″	3616	278	256	238	222	208	196	185	176	167	159	151	145	139
	14′–0″	3616	258	238	222	206	193	182	172	163	155	147	141	135	129
	15 –0″	3425	228	210	195	182	171	161	152	144	137	130	124	119	114
	16′–0″	3015	188	173	161	150	141	133	125	119	113	108	103	98	94
PG92½	12′–0″	4193	349	321	298	278	262	248	232	220	209	199	190	182	174
	13′–0″	4193	322	300	278	259	242	228	216	204	194	185	177	169	161
	14′–0″	4193	299	275	255	238	223	210	198	188	179	170	162	155	149
	15′–0″	4193	279	258	240	223	209	197	186	176	168	160	152	146	140
	16′–0″	4030	252	234	218	203	191	179	169	160	152	145	138	132	126
	17′–0″	3590	211	195	181	169	158	149	141	133	127	121	115	110	106
	18′–0″	3200	178	164	153	143	134	126	119	113	107	102	97	93	89
PG93	14′–0″	4193	299	276	256	239	224	211	199	189	179	171	163	156	149
	15′–0″	4193	279	258	239	223	209	197	186	176	168	159	152	146	140
	16′–0″	4193	261	241	224	209	196	189	174	165	153	149	143	136	130
	17′–0″	3950	232	214	199	185	174	164	155	146	139	132	126	121	116
	18′–0″	3525	196	181	168	157	147	138	131	124	118	112	107	102	98
PG102½	12′–0″	5032	420	388	360	336	315	296	280	265	252	240	229	219	210
	13′–0″	5032	387	358	332	310	291	273	258	244	232	221	211	202	194
	14′–0″	5032	359	331	307	286	269	253	238	226	215	205	195	187	179
	15′–0″	5032	335	310	287	268	251	236	223	212	201	191	183	175	168
	16′–0″	4760	298	275	255	239	224	210	199	188	179	170	163	156	149
	17′–0″	4485	264	244	226	212	198	186	176	167	158	146	144	138	132
	18′–0″	4210	234	216	200	186	175	165	156	148	140	133	128	122	117
	19′–0″	3785	199	184	171	159	149	140	132	126	119	114	109	104	99
	20′–0″	3420	171	158	147	137	128	121	114	118	103	98	94	89	86
PG103	13′–0″	5032	387	367	332	310	290	273	258	244	232	222	210	202	194
	14′–0″	5032	359	332	308	288	270	254	240	227	216	206	196	187	180
	15′–0″	5032	335	310	287	268	252	236	223	212	202	191	183	175	163
	16′–0″	5032	314	290	270	252	236	221	210	198	189	179	171	164	157
	17′–0″	4915	289	268	248	232	216	204	193	182	173	165	158	151	144
	18′–0″	4620	257	237	220	206	193	181	171	162	154	147	140	134	129
	19′–0″	4150	219	202	188	175	164	155	146	138	132	125	120	114	110
	20′–0″	3736	187	173	160	150	140	132	125	118	112	107	102	98	94

TRUSCON P-G (*Plate Girder*) STEEL JOISTS

TABLE No. 2 (Continued)

Type Joist	Clear Span	Total Safe Load	TOTAL SAFE LOAD PER SQUARE FOOT FOR VARIOUS JOIST SPACINGS												
			12″	13″	14″	15″	16″	17″	18″	19″	20″	21″	22″	23″	24″
PG103½	15′–0″	5032	335	310	287	268	251	237	224	212	201	192	183	175	168
	16′–0″	5032	312	288	267	250	234	220	208	197	187	178	170	163	156
	17′–0″	5032	296	273	254	237	222	209	197	187	177	169	162	154	148
	18′–0″	5020	279	258	239	223	209	197	186	176	167	159	152	146	139
	19′–0″	4500	237	218	203	189	178	167	158	150	142	135	129	124	118
	20′–0″	4075	204	188	175	163	153	144	136	129	122	117	111	106	102
PG113	12′–0″	6404	535	494	459	428	401	378	357	338	321	306	292	279	258
	13′–0″	6404	493	455	422	394	270	348	328	311	296	281	269	257	247
	14′–0″	6404	457	422	392	366	343	323	325	289	274	261	249	238	229
	15′–0″	6404	427	394	366	342	320	301	284	270	256	244	233	223	214
	16′–0″	6135	383	354	328	306	287	270	255	242	230	219	209	200	192
	17′–0″	5770	340	314	292	272	255	240	227	215	204	194	185	177	170
	18′–0″	5450	303	280	260	242	227	214	202	191	182	173	165	158	151
	19′–0″	5160	271	250	232	217	204	192	181	171	163	155	148	142	136
	20′–0″	4820	241	222	207	193	181	170	160	152	145	138	131	126	121
	21′–0″	4370	208	192	178	166	156	147	138	131	125	119	114	108	104
	22′–0″	3985	181	167	155	145	136	128	121	114	108	104	99	94	91
PG113½	13′–0″	6404	493	455	423	395	370	348	329	312	296	282	269	257	246
	14′–0″	6404	457	422	392	366	343	323	305	289	274	261	250	238	229
	15′–0″	6404	427	395	366	342	320	302	285	270	256	244	233	223	214
	16′–0″	6404	400	369	343	320	320	282	267	252	240	228	218	208	200
	17′–0″	6250	368	340	315	295	276	260	245	232	221	210	201	192	184
	18′–0″	5900	328	303	281	262	246	232	219	207	197	187	179	171	164
	19′–0″	5600	295	272	253	236	221	208	197	186	177	169	161	154	148
	20′–0″	5225	262	242	225	210	197	185	175	165	157	150	143	137	131
	21′–0″	4740	226	209	194	181	170	160	151	143	136	129	123	118	113
	22′–0″	4320	196	181	168	157	147	138	131	134	118	112	107	102	98
PG123½	14′–0″	7124	510	470	437	408	382	360	340	322	306	291	278	266	255
	15′–0″	7124	475	440	407	380	356	335	317	300	285	272	259	248	238
	16′–0″	7124	445	411	381	356	334	314	297	281	267	254	243	232	222
	17′–0″	7124	420	388	360	336	315	296	280	265	252	240	229	219	210
	18′–0″	6790	377	348	323	302	283	266	252	238	226	216	206	197	189
	19′–0″	6435	338	312	290	270	254	239	225	214	203	193	184	176	169
	20′–0″	6100	305	282	262	244	229	215	203	193	183	174	166	159	153
	21′–0″	5810	277	256	237	221	208	195	185	175	166	158	151	145	139
	22′–0″	5415	246	228	211	197	185	174	164	155	148	141	134	129	123
	23′–0″	4950	215	199	184	172	161	152	143	136	129	123	117	112	108
	24′–0″	4550	190	175	163	152	142	134	127	120	114	108	103	99	95
PG144	16′–0″	9144	571	527	490	457	428	403	380	360	343	327	312	298	286
	17′–0″	9144	537	496	461	430	403	379	358	340	323	307	293	280	269
	18′–0″	9144	507	469	435	406	380	358	338	320	304	290	276	265	254
	19′–0″	9144	481	445	413	385	361	340	321	304	289	275	262	251	242
	20′–0″	8960	448	415	384	359	336	317	299	283	269	256	245	234	224
	21′–0″	8530	406	375	348	325	305	287	271	257	244	232	222	212	203
	22′–0″	8150	371	342	318	297	278	262	247	234	222	212	202	194	186
	23′–0″	7785	338	312	290	270	254	239	225	214	203	193	184	176	169
	24′–0″	7470	311	287	267	249	233	220	207	196	187	177	170	162	156
	25′–0″	7170	287	265	246	230	215	202	191	181	172	164	156	150	144
	26′–0″	6650	256	236	219	205	192	181	171	162	153	146	139	133	128
	27′–0″	6160	228	210	195	182	171	161	152	144	137	130	124	119	114
	28′–0″	5720	204	188	175	163	153	144	136	129	123	116	111	106	102

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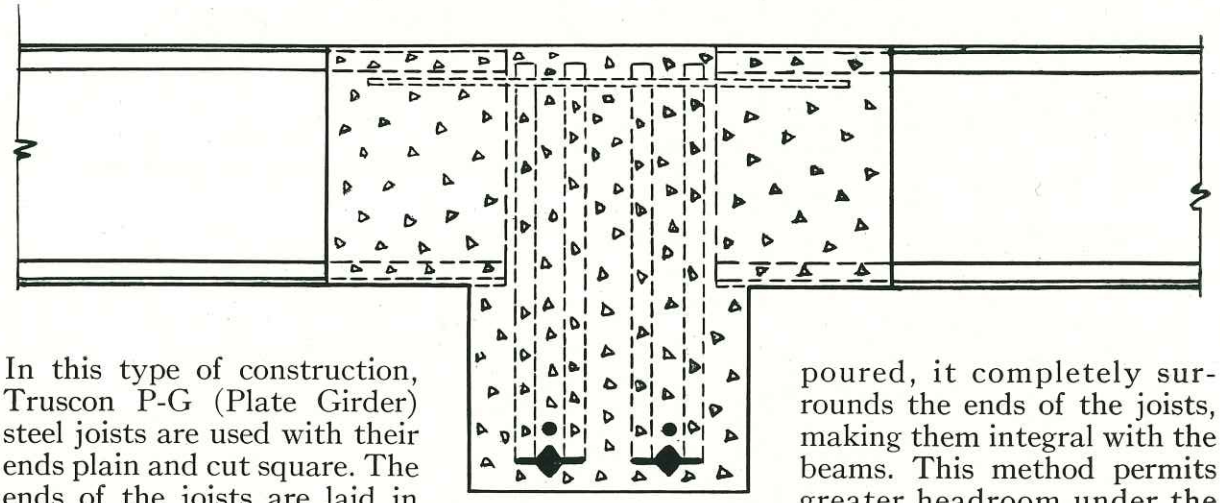
Construction Details

Concrete Skeletons

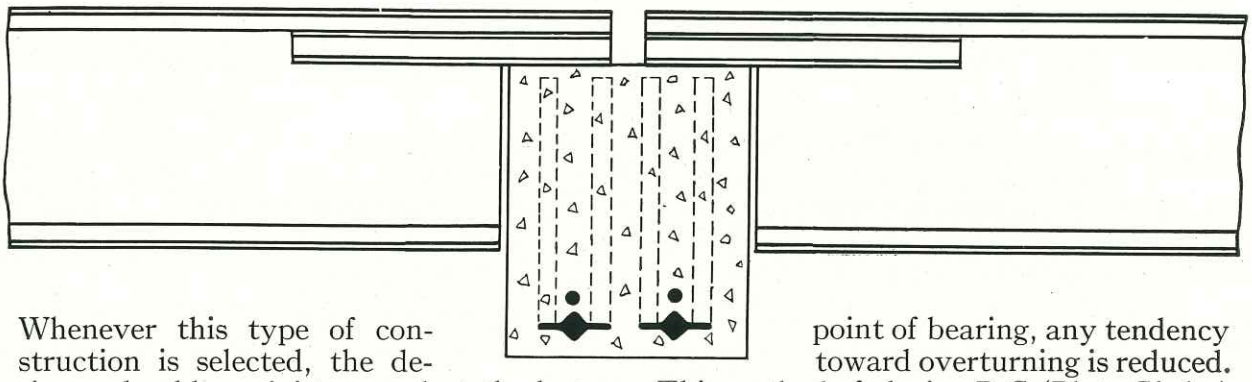
When using Truscon P-G (Plate Girder) Steel Joists in connection with concrete skeleton structures, the designer may use either of the two construction details illustrated on this page. Both details are recognized as thoroughly sound, but only careful study of the requirements and limitations of any particular job will determine which will work out to the best advantage.

Framing into Reinforced Concrete Tee Beams



In this type of construction, Truscon P-G (Plate Girder) steel joists are used with their ends plain and cut square. The ends of the joists are laid in the beam boxes and the form-work is built up around them. When the concrete is poured, it completely surrounds the ends of the joists, making them integral with the beams. This method permits greater headroom under the supporting girders, often reducing the height of the building.

Resting on Top of Reinforced Concrete Beams

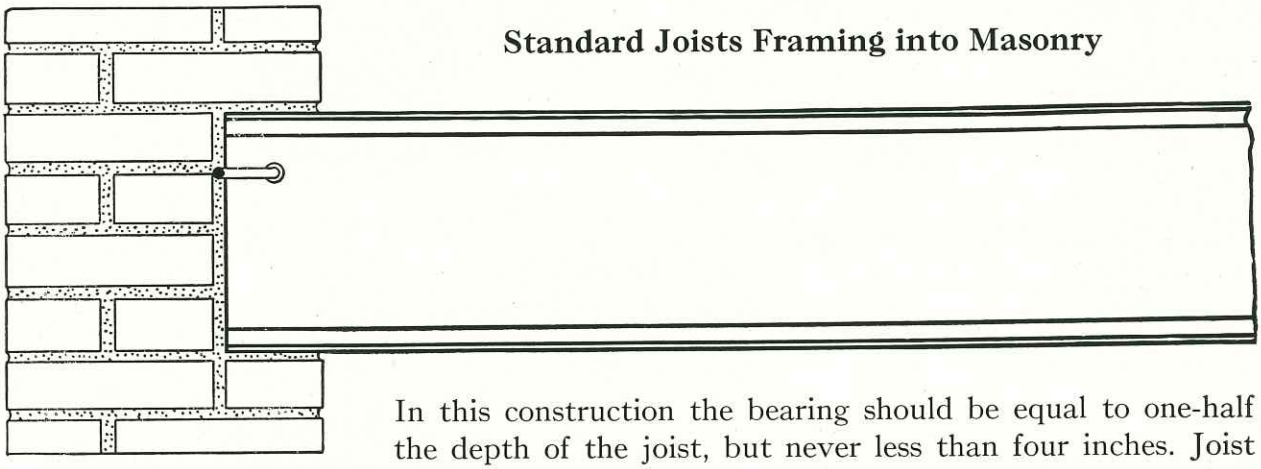


Whenever this type of construction is selected, the designer should use joists coped at the bottom. The joists are simply laid in place on top of the beams. Since the center of gravity of these joists is lower than the point of bearing, any tendency toward overturning is reduced. This method of placing P-G (Plate Girder) Steel Joists on concrete beams eliminates the necessity of framing the joists into form work.

Construction Details

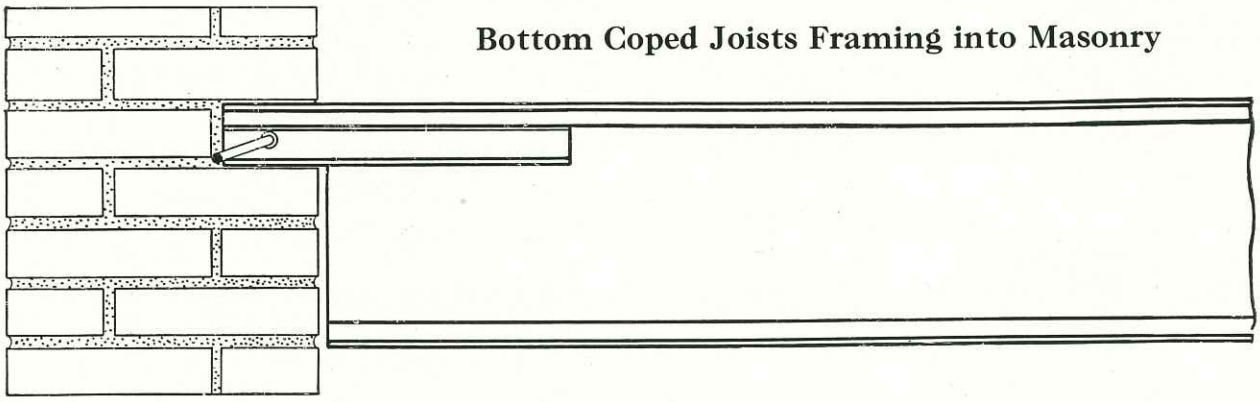
Masonry Walls

When using Truscon P-G (Plate Girder) Steel Joists in connection with masonry walls, two approved methods are open to the designer. They are illustrated and described below.



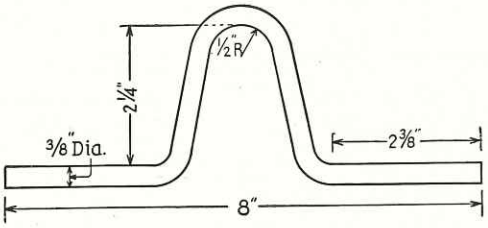
Standard Joists Framing into Masonry

In this construction the bearing should be equal to one-half the depth of the joist, but never less than four inches. Joist anchors should be used as a bond, but ordinarily not more than every third joist need be anchored. Cement mortar should be slushed around the joist to insure a tight job.



Bottom Coped Joists Framing into Masonry

The particular feature of merit in this detail is that it requires but one course of brick to imbed the ends of the bottom coped joists thus eliminating the time required to fit bricks in between joists. Joist Anchors should be used to anchor every third joist.



Wall Anchor No. 5

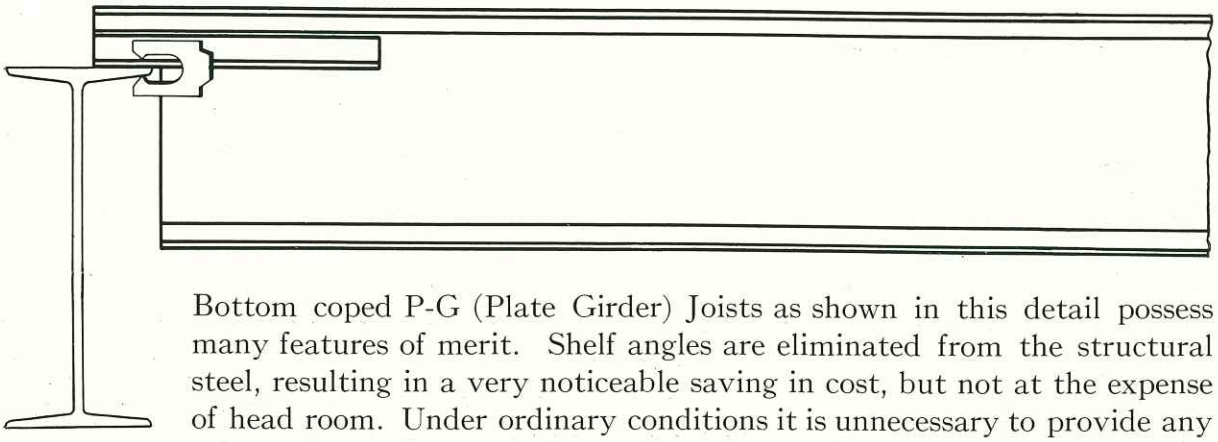
Wall Anchors made of 3/8" round rods and shaped as shown in the accompanying sketch should be used on every second or third Joist as an additional bond between floor and wall construction when the wall is of such a height or nature as not to be self-sustaining.

Construction Details

Structural Steel

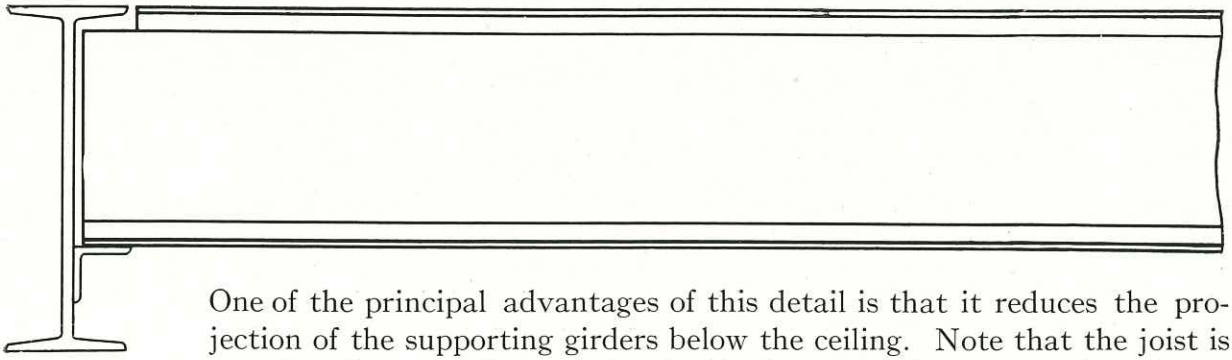
P-G (Plate Girder) Joists can be readily applied to structural steel frame work, in a variety of ways. Two methods which are widely used and generally adaptable are shown here.

Supported on Top of Structural Steel Beams



Bottom coped P-G (Plate Girder) Joists as shown in this detail possess many features of merit. Shelf angles are eliminated from the structural steel, resulting in a very noticeable saving in cost, but not at the expense of head room. Under ordinary conditions it is unnecessary to provide any means of attachment between the joists and the supporting structural members. For a temporary attachment, however, plate clips as shown below may be used.

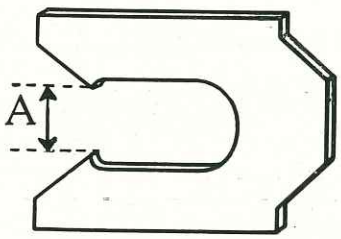
Supported on Shelf Angles Attached to Structural Steel Beams



One of the principal advantages of this detail is that it reduces the projection of the supporting girders below the ceiling. Note that the joist is coped at the top to bring it level with the top of the structural steel girder, thus assuring maximum head room under the girder.

Plate Clips

Plate Clips are used as a temporary attachment for connecting the Joists to structural bearing members. When the clips are driven on tightly, they hold the Joists vertically and accurately during erection. They are made in sizes with openings (dimension A) from 5/16″ to 1½″ in increments of 1/16″.



Lath Clip

THE clips used in attaching Metal Lath to the Truscon P-G (Plate Girder) Steel Joist are made of [illegible] gauge wire in dimensions as listed in the accompanying table. The lath clips are easily attached with the aid of any ordinary pair of pliers; spaced 12″ apart for the top lath and 8″ apart for the ceiling lath.

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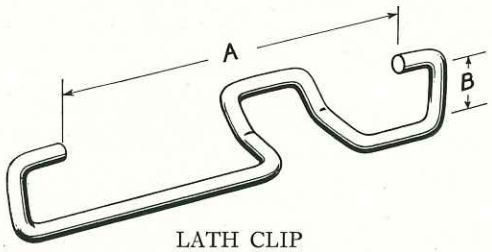


LATH CLIP

CLIP NO.	A	B	FOR FLANGE WIDTH
5	$2\frac{3}{8}$″	$\frac{5}{16}$″	$2\frac{1}{2}$″
6	$2\frac{15}{16}$″	$\frac{5}{16}$″	3″
7	$3\frac{7}{16}$″	$\frac{5}{16}$″	$3\frac{1}{2}$″
8	4″	$\frac{5}{16}$″	4″

In attaching lath clips to Metal Lath on top of the joists, care should be taken to place the clip between the ribs of the Lath so that if wood screeds are used, the clip will not project above the level of the ribs of the lath and thus interfere with the placing of the screeds.

In attaching ceiling lath, the clip should be inserted in the first mesh opening adjacent to a rib in the lath and placed so that the small U-shaped portion will lay directly underneath a rib and thus properly support the lath. These clips have proven to be the most easily applied and positive means of attaching metal lath to the joists.

Three Progressive Steps for the Proper Application of the Lath Clip

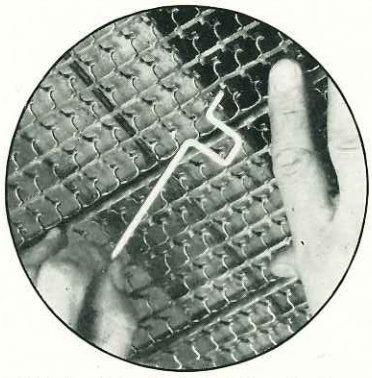


FIG. 1—The clip is held by the long end in the left hand; the short end is inserted through the mesh.

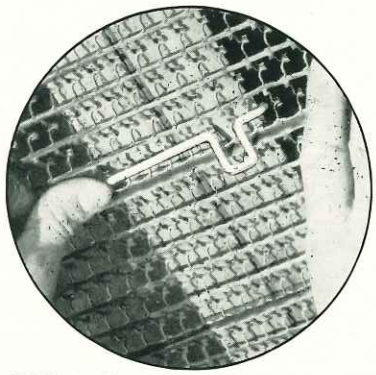
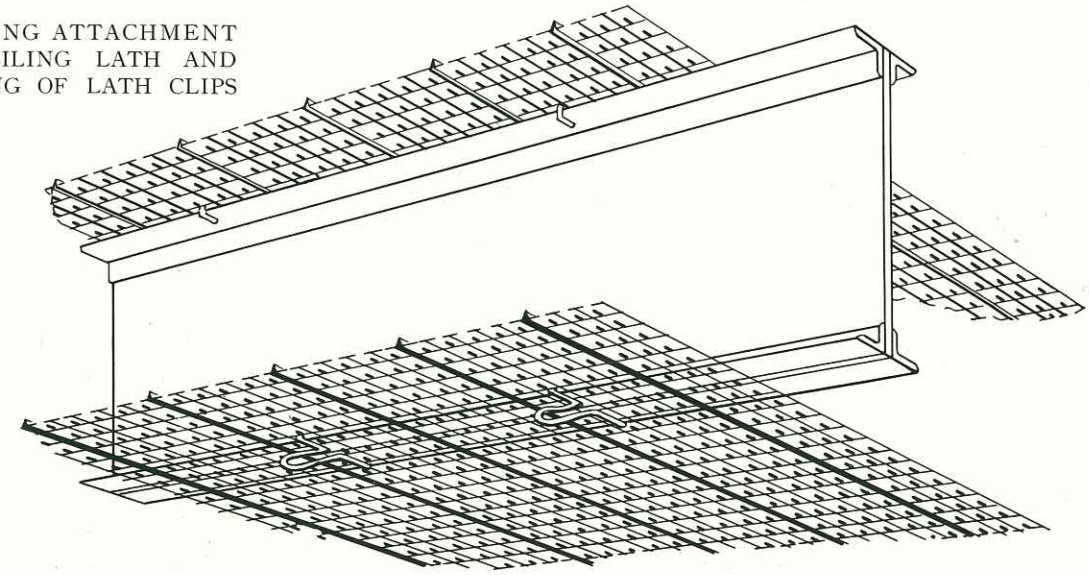


FIG. 2—Inserting the long end of the clip through the mesh and held in this position with the thumb.

FIG. 3—Pinching together the small U-shaped portion of the clip which lays under the rib of the lath.

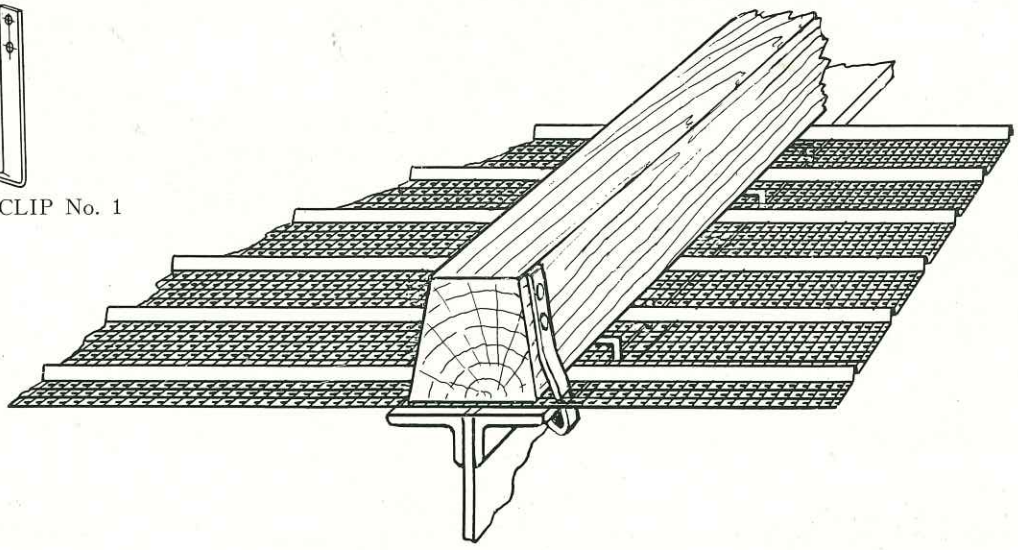
SHOWING ATTACHMENT OF CEILING LATH AND SPACING OF LATH CLIPS



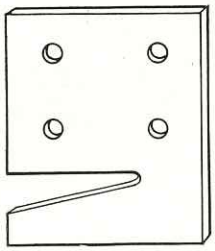
Attachment of Screeds

When wood finished floors are used in connection with Steel Joist construction, it is necessary that nailing screeds be provided. We recommend beveled screeds as shown in the accompanying illustrations.

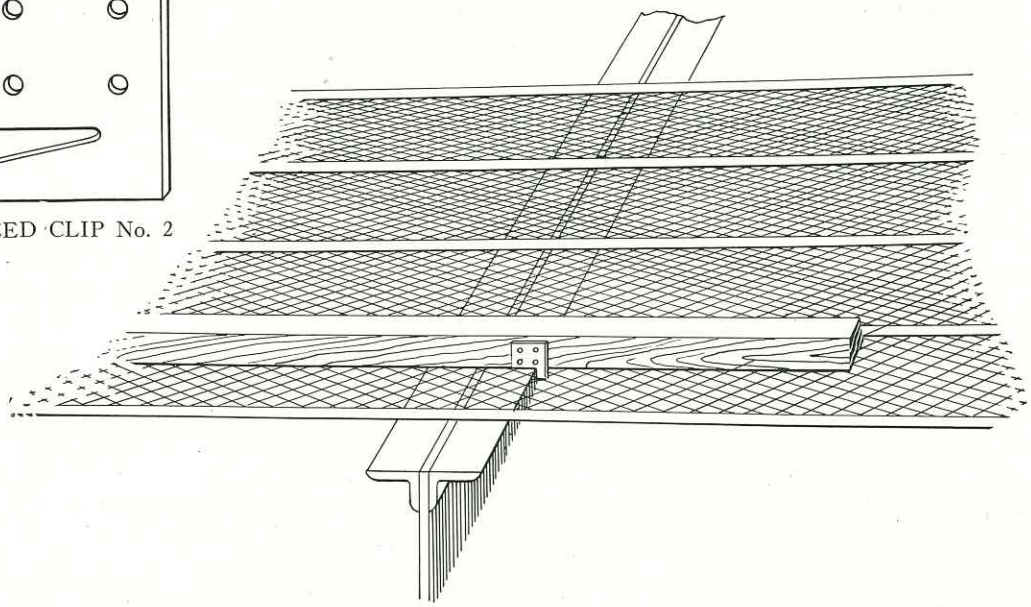
SCREED CLIP No. 1



When 2″x2″ screeds are used in conjunction with a 2″ concrete slab, the screeds should be placed parallel to and directly above the joists, thus thoroughly embedding them in concrete. Screed Clips No. 1 are used in this construction and they should be staggered on either side of the screeds and spaced about 16″ apart.

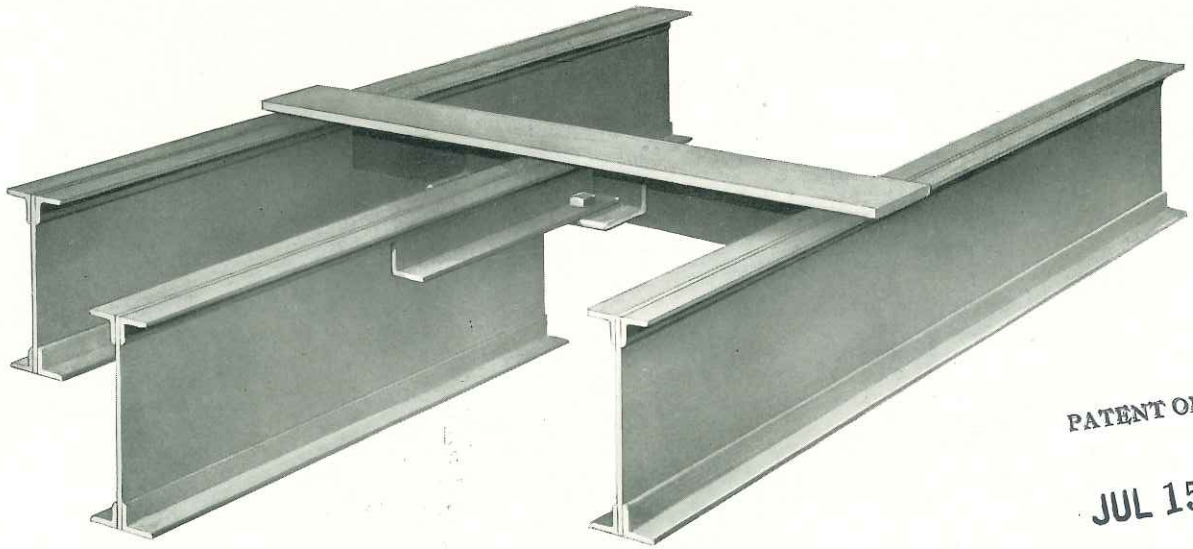


SCREED CLIP No. 2



When 2″x2″ screeds are used in conjunction with a 2″ concrete slab, the screeds may, if desired, be placed at right angles to the joists. This construction, however, does not protect the under-side of the screeds. Screed Clips No. 2 are used in this construction and they should be staggered on either side of the screeds.

Construction Details



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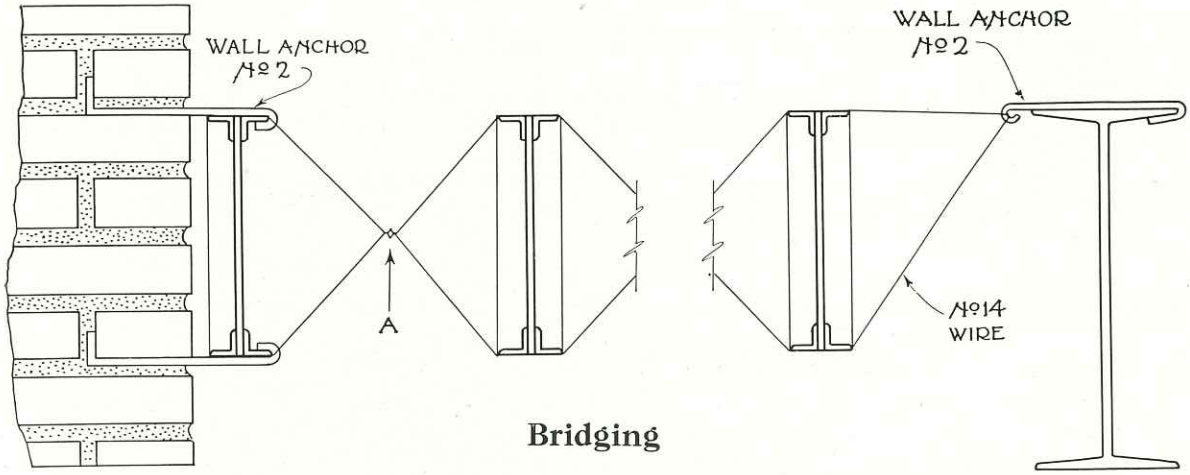
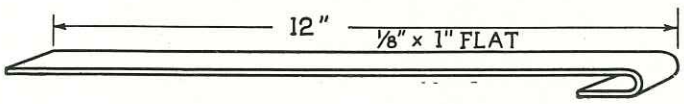
Framing Around Small Openings

When it is necessary to frame around small openings such as required for dumb-waiters, this framing can be very readily done in P-G (Plate Girder) Joist Construction by the introduction of a header angle to support the tail joist. We recommend that large openings be framed entirely in structural steel.



Bridging

No. 14 gauge wire is wrapped around each joist and crossed diagonally between joists, being twisted for tension at points "A". Wall anchors, if specified, can be used to connect the joists to masonry, thus making a rigid anchorage for the bridging. When impossible to tie the bridging to parallel structural members, the wall anchor may be bent in the field to function as shown. Lines of bridging should be spaced not over 6′-0″ on centers.



WALL ANCHOR NO. 2

To be bent on the job and used to anchor bridging or joists to masonry or structural steel.

Specifications

GENERAL

1 Where Steel Joist floor construction is specified it is understood to mean P-G (Plate Girder) Steel Joists of the size and spacing as shown on the drawings or to properly support the dead load plus the specified live load. Both floor slabs and ceiling shall be supported by metal lath firmly attached to the joists.

MATERIALS

2 Each joist shall consist of four structural steel angles joined to a rolled steel strip by the high pressure electric welding system to form a plate girder.

DESIGN

3 Steel Joists shall be designed on the basis of 16,000 (or 18,000) pounds stress per square inch and their deflection shall not exceed 1/360th of the span.

SPACING

4 For concrete floor and roof construction the spacing of joists shall not exceed 24″ for floor construction or 30″ for roofs.

PAINTING

5 All steel joists shall be painted one shop coat of metal protective paint known as Bar Ox or equal.

SLAB REINFORCEMENT

6 The top concrete slab shall be reinforced and supported by metal lath with main ⅜″ ribs not more than 4.8″ apart, the lath to be placed with the ribs up and at right angles to the joists. Sheets shall lap at least 2″ at the end where the lap occurs over a joist or 4″ where the lap occurs between the joists, and the ends of both sheets shall be wired at the lap. Attach the lath firmly to the top flange of the joists by means of special wire lath clips spaced not farther apart than 12″. For joist spacing up to 19″ on centers, use metal lath weighing not less than 3.4 lbs. per sq. yd. and for spacings between 19″ and 24″ on centers use metal lath weighing not less than 4 lbs. per sq. yd. Where the floor finish is other than wood, the structural slab is to be reinforced with a No. 10 gauge 6″x6″ welded steel fabric.

BRIDGING

7 Steel Joists shall be bridged at intervals of not over 6′-0″ with one row of bridging not more than 3′-0″ from each end. The bridging shall consist of No. 14 wire wrapped around each joist and crossed diagonally between joists. The wires shall be drawn tight by twisting where they cross between the joists, each end of each line of bridging to be anchored securely to the wall by means of wall anchors or to structural steel member which runs parallel to the joist at each end of the panel.

CEILINGS

8 Where plastered ceilings are attached directly to the joists, metal lath conforming to the following weights for various spacings shall be attached with the ribs up and at right angles to the joists by means of lath clips spaced not more than 8″ on centers. The ends of the sheets to be lapped 2″ where the lap occurs at the joists and 4″ where the lap occurs between the joists; both ends of sheets to be securely wired.

9 Joist spacing up to 19″—Flat rib lath weighing not less than 3.2 lbs. per sq. yd. or ⅜″ rib lath weighing 3 lbs. per sq. yd.

10 Joist spacing over 19″ and less than 24″ on centers, ⅜″ rib lath weighing 3.4 lbs. per sq. yd. and for joist spacing up to 30″ on centers, ⅜″ rib lath weighing 4 lbs. per square yard.

BEARINGS

11 Joists shall have a minimum bearing of 4″ on concrete or masonry and 2½″ on steel.

FLOOR SLAB

12 When the floor finish is cement, tile, or similar materials the structural slab shall be continuous and not less than 2″ in thickness of 1:2:4 stone concrete.

13 This concrete shall be what is known as a dry mix and if buggies or barrows are used for distribution, planks shall be placed across the top of the joists for runways and the concrete shall not be dumped between the joists but shall be dumped over the top of a joist so as to prevent unnecessary sagging of the metal lath.

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WOOD FLOORS

14 Where wood floors are specified 2″x2″ beveled wood screeds shall be laid on top of the lath, parallel and directly over the centers of the joists and attached to the top chord of the joists by means of screed clips spaced not more than 16″ on centers and staggered on either side of screed. The space between the screeds shall be filled with concrete as specified under floor slabs.

15 Where single wood floors are specified the joist spacing shall not exceed 20″ on centers except where the wood screeds are laid at right angles to the joists, in which case these screeds shall be 1″x2″ and shall be blocked up above the lath about 1″ so as to allow 1″ of concrete under the screed and care should be taken in pouring the concrete to see that the space under the screed is completely filled. In cases where screeds are run at right angles to joists, they shall be spaced not over 20″ on centers.

PLASTER CEILINGS

16 Plaster ceilings shall be not less than ¾″ in thickness and shall be of cement, hard wall or gypsum plaster.

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